Chromosomes of Vicia.—SAKAMURA[22] has found in the nuclei of the root tip of *Vicia Faba* during metaphase 12 already split chromosomes, 2 of which are considerably larger ("M-Chromosomen") and constantly showing middle and end constrictions ("m und e-Einschnürung"). In heterotypic mitosis these same constrictions are present in the one large bivalent ("M-Geminus"), which is believed to be composed of the two M-chromosomes. The fibers are attached at the end of the short chromosomes; but to the M-chromosomes and M-bivalent they are fastened at the middle, causing them to assume a V-shape when traveling to the poles. As a result, there are evident 14 arms in somatic anaphase, this feature probably being the cause of the 14-chromosome count; while in heterotypic mitosis, due to the splitting of each of the daughter chromosomes, there are 5 V's and one double V. The chief theory accounting for the origin of the "Einschnürung" is that the M-chromosomes at first are without constrictions, and then under certain conditions constrictions arise. This mechanism is shown to be due to an uneven separation of the chromosomes and to the strain of the fibers above this point, causing a stretching of the chromatin, so that when they do dissociate completely there is this apparent constriction. Before the m and e-constrictions could become hereditary characters they must first have occurred in heterotypic anaphase. While the investigation strengthens the individuality theory of the chromosomes, it throws little light upon the cause of the closely related species and varieties, two points that the author has attempted to prove.—MILDRED NOTHNAGEL.

Vegetative vigor and reproduction.—PIETERS[23] has made an interesting contribution to our knowledge of the structural responses of plants to varying chemical and physical conditions. The work of KLEBS, indicating that the appearance of reproductive cells is a response to diminishing vegetative activity, and that structures in general represent expressions of the potentialities of an organism, called out by the prevailing conditions for metabolism, has set in train investigations which should be multiplied. PIETERS used two species of *Saprolegnia* and two of *Achlya* in his investigations, and a summary of his results is as follows. There is no necessary relation between vegetative growth and sexual reproduction when the available food exceeds the minimum concentration necessary for the species. This minimum concentration of food necessary varies with the species, but in general is in the neighborhood of 0.1 per cent peptone for the production of both sporangia and oogonia. While growing vegetatively, a mycelium may develop tendencies that may affect the number and character of the reproductive organs produced subsequently under different conditions. Of the carbohydrates used, maltose and levulose are especially useful for vegetative growth, and the latter is particularly effect-

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[22] SAKAMURA, TETSU, Über die Einschnürung der Chromosomen bei *Vicia Faba* L. Bot. Mag. (Tokyo) **29**:287–300. *pl. 13, figs. 12.* 1915.

[23] PIETERS, A. J., The relation between vegetative vigor and reproduction in some Saprolegniaceae. Amer. Jour. Bot. **2**:529–576. 1915.